NIKOL'SKIY, V.N., Cand Med Sci — (diss) "State of phagocyte activity of blood leucocytes in patients with disorder of the blood circulation of the brain."

Kos 1958, 12 pp (First Kos Order of Lenin Med Inst im I.M. Sechenov) 200 copies (KL, 32-58, 112)

NIKOL'SKIY, Ye.K.

Phagocytic activity of leukocytes in circulatory disorders of the brain [with summary in French]. Zhur.nevr. i psikh. 58 no.1:29-34 '58. (MIRA 11:2)

1. Kafedra nervnykh bolezney (zav. - prof. Ye.K.Sepp, [deceased]) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova.

(BRAIN, blood supply,
dis., eff. on phagocytosis (Rus))
(PHAGOCYTOSIS, in var. dis.
brain circ. dis. (Rus))

NIKOL'SKIY, V.N.; MOSKIN, M.A.

Clinical characteristics of encephalitis observed in Leningorsk. Zhur. nevr. i psikh. 61 no.6:865-868 '62. (MIRA 15:2)

1. Kafedra nervnykh bolezney (ispolnyayushchiy oby zannosti zaveduyushchego - dotsent S.A.Mel'nikov) I Moskovskogo ordena Lenina meditsinskogo instituta.
(ENCEPHALITIS)

RITOVA, [illegible]; MIKOLAYEV, V.N.

[illegible] of the influenza virus and ECHO virus 6. Vop. virus. (MIRA 18:10)
20 n.2:219-223 Mr-Ap '65.

1. Institut virusologii imeni D.I.Ivanovskogo AMN SSSR i Gor'kovskaya bakteriologicheskaya laboratoriya Ministerstva zdravookhraneniya SSSR, Moskva.

NIKOL'SKIY, V.P.

Sverkhzvukovye techeniia v diffuzore tsentrobezhnogo nagnetatelia. Moskva, Oborongiz, 1942. 3 p. (TSIAM. Trudy, no. 44)

Title tr.: Supersonic flow in a centrifugal supercharger diffuser.

TL701.A1M72 no.44

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955

SHPITAL'NIKOV, Konstantin Fedorovich; NIKOL'SKIY, V.P., kand. tekhn. nauk, retsenzent; YAMINSKIY, V.V., kand. tekhn. nauk, red.; SAVEL'YEV, Ye.Ya., red. izd-va; MOZEL', V.I., tekhn. red.

[Semigraphical methods of determining the air parameters of the centrifugal stage of a compressor] Grafoanaliticheskie sposoby opredeleniia parametrov vozdukha v tsentrobezhnoi stupeni kompressora. Moskva, Mashgiz, 1961. 227 p. (MIRA 15:2)
(Compressors)

NIKOL'SKIY, V. S.

USSR/Electronics - Radio Waves Oct 52

"The Electronics of a Planar Comb," V. M. Lopukhin and V. S. Nikol'skiy

"Zhur Tekh Fiz" Vol 22, No 10, pp 1599-1605

Investigate radio-wave properties of planar comb pierced by electron currents, taking into account the scatter of the electrons according to velocity. Give general method of solving problem for arbitrary stationary function $f_0(v)$ of distribution of the electrons in the currents

236855

According to velocity. Indebted to Prof S. D. Gvozdover. Cite related works of L. M. Losheakov (1949), A. I. Akhiyezer, and Ya. B. Faynberg (1951).

236855

NIKOL'SKIY, V. S., VASIL'YEV, K. I. And LOPUKHIN, V. M.

"The Applications of the Kinetic Equation in the Theory of Amplifiers of Centimetric Radio Waves," a paper given at the All-University Scientific Conference "Lomonosov Lectures", Vest. Mosk. Un., No.8, 1953

Trabslation 007895, 1 Mar 56

VASIL'YEV, Ye.I.; LOPUKHIN, V.M.; NIKOL'SKIY, V.S.

Theory of traveling-wave tubes with a computation of thermal motion of electrons in flow. Vest.Mosk.un. 8 no.5:45-52 My '53. (MLRA 6:8)

1. Fizicheskiy fakultet Moskovskogo gosudarstvennogo universiteta. (Electronics)

Physics Faculty, Moscow State Univ-ty im M. V. Lomonosov.

L 15168-65 EWT(m)/EWA(d)/EPR/EWP(t)/EWT(b) Ps-4 IJP(c) MJW/JD/JG
ACCESSION NR: AP5001438 S/0135/64/000/008/0754/0756

AUTHOR: Barkaya, D. S. (Engineer); Belous, Yu. V. (Engineer); Nikol'skiy, V. S. (Engineer); Shvartsbart, Ya. S. (Engineer)

TITLE: Effect of the technological process of treating iron-chromium-aluminum alloys on surface quality and service life of heating elements

SOURCE: Stal', no. 8, 1964, 754-756

TOPIC TAGS: ferroalloy, chromium containing alloy, aluminum containing alloy, corrosion reistant alloy/EI-626 alloy

Abstract: A high stability of heaters made from iron-chromium-aluminum alloy EI-626 is achieved by a thorough cleansing of the surface to remove contaminations associated with the reduction process. The Cl" ions which form during the NaNO3-salt coating of the wire prior to drawing decrease the stability of the metal of the heaters to gaseous corrosion in the course of service. Polishing of the wire in its final size is very effective. Orig. art. has 1 table.

ASSOCIATION: Zavod "Elektrostal'" (Electrostal Plant)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NO REF SOV: 001 OTHER: 001 JPRS

Card 1/1

ACCESSION NR: AP4014251 S/0133/64/000/002/0137/0139

AUTHORS: Nikol'skiy, V. S.; Golikov, I. N.

TITLE: Melting nickel-chromium alloys in an arc furnace with oxygen supply

SOURCE: Stal', no. 2, 1964, 137-139

TOPIC TAGS: nickel chromium alloy, melting, oxygen blow, Kh20N80 nickel chromium alloy, Kh15N60 nickel chromium alloy, titanium removal, silicon content in nichrome, nichrome strength, nichrome plasticity, Kh20N80T3 alloy, Kh20N80T alloy

ABSTRACT: Experimental results obtained in melting Ni-Cr alloys in an arc furnace with blown-in oxygen are presented. The procedure was developed for obtaining metal with a low C content and free of titanium (despite the use of Ti-containing waste products such as (Kh20N80T3, Kh20N80T, and others). The relation of Cr/C to temperature was studied in order to determine optimal content of chromium. A schematic drawing of the melting assembly used in these experiments is shown in Fig. 1 of the Enclosure. It consists of a 50-kg induction oven with the crucible (a) made of magnesium-chromium, a floating tungsten-rhenium thermocouple with an alundum tip (3) connected to the potentiometer (b) and to the oxygen tank (2) Oxygen was passed from the tank through the meter (2) into the quarts tube (e).

Card 1/2

ACCESSION NR: AP4014251

According to the tests of several melts in the temperature interval 1500-1800C, the Cr/C relation was

$$\lg \frac{[Cr]}{[C]} = \frac{20\,000}{T} + 12{,}20.$$

The authors conclude that this melting procedure resulted in an effective decarbonization of the metals, in the removal of Ti, and an in a greater content of Si which increased the strength and plastic properties of the alloys. Orig. art. has: 4 figures and 2 formulas.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 03Mar64 ENCL: 01

SUB CODE: ML NO REF SOV: 002 OTHER: 005

Card 2/2

NIKOL'SKIY, V.S.; GOLIKOV, I.N.

Making nickel-chromium alloys in an [illegible] furnace with oxygen blowing of the bath. Stal' 24 no.2:137-139 F '64. (MIRA 17:9)

RAIKHER, M.M., professor; KAMINSKIY, I.N., inzhener; NIKOL'SKIY, V.S., redaktor; SUKOVA, V.A., redaktor; ANDRIYEV, G.G., tekhnicheskiy redaktor.

[Complex time study in coal mines and pits] Kompleksnyi khronometrazh na ugol'nykh shakhtakh i kar'erakh. Moskva, Ugletekhizdat, 1954. 203 p. (MLRA 8:5)
(Time study)

NIKOL'SKIY, Viktor Sergeyevich; GRIBIN, G.P., otvetstvennyy red.;
SUROVA, V.A., red.izdatel'stva; ALADOVA, Ye.I., tekhn.red.;
MERLOV, A.P., tekhn.red.

[Organization of labor and wages in coal mines, a handbook for mine workers] Organizatsiia truda i zarabotnaia plata na ugol'nykh shakhtakh; spravochnoe posobie dlia rabotnikov shakhty. Moskva, Ugletekhizdat, 1957. 258 p. (MIRA 10:12)
(Coal mines and mining) (Wages)

48-5-36/56

SUBJECT: USSR/Luminescence

AUTHORS: Komovskiy G.F., Nikol'skiy V.S. and Lozhnikova O.N.

TITLE: Thermoluminescence of Minerals (Termolyuminestsentsiya mineralov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, #5, pp 711-714 (USSR)

ABSTRACT: Various samples of calcites were investigated with respect to thermoluminescence. They were subjected to a preliminary irradiation by X-rays by means of an X-ray tube BSV-W yielding approximately 100 r/sec. A photoelectronic multiplier of the FEU-19 type was applied to study the thermo-luminescence of these minerals and to record the curves of its intensity.

The inspection of the curves represented by Fig 1 and 2 in the paper shows that the magnitude of luminescence peaks depends on the time of preliminary irradiation, increasing with time.

The comparison of thermoluminescence curves of the yellow calcite, Fig 1, and the red-violet calcite, Fig 2, shows that the peak of the first curve is considerably higher than that

Card 1/2

TITLE: Thermoluminescence of Minerals (Termolyuminestsentsiya mineralov)

of the red-violet calcite, which indicates that the yellow calcite is considerably older than the red-violet one. This conclusion was confirmed by geological data.

Thus, the method of thermoluminescence can be applied for studying the age of the rocks and minerals as was suggested by Daniels (1). In addition to this, the authors propose to use this method for the control of concentration processes in the cases when a mineral complex to be concentrated contains a mineral possessing an ability for luminescence.
The article contains 4 graphs.
Four non-Slavic references are cited (one of them translated into Russian).

INSTITUTION: State Institute of Rare Metals, (Giredmet)

PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress.

Card 2/2

NIKOL'SKIY, Viktor Sergeyevich

[Wages and the establishment of norms] Normirovanie i oplata truda. Moskva, Gospolitizdat, 1960. 31 p. (Dlia slushateleĭ nechal'nykh ekonomicheskikh shkol i kruzhkov na promyshlennykh predpriiatiiakh, no.5) (MIRA 14:7)

(Wages)

NIKOL'SKIY, Viktor Sergeyevich; TYURIN, Mikhail Alekseyevich; SUROVA, V.A., red. izd-va; MINSKER, L.I., tekhn. red.

[Handbook for miners working on the surface of coal and shale mines] Pamiatka dlia rabochikh, zaniatykh na poverkhnosti ugol'nykh i slantsevykh shakht. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1961. 142 p. (MIRA 14:9)
(Coal mines and mining)

NIKOL'SKIY, V.S.; TYURIN, M.A.; SUROVA, V.A., red. izd-va; MINSKER, L.I., tekhn. red.

[Handbook of regulations for workers in coal and shale pits] Pamiatka dlia rabochikh ugol'nykh i slantsevykh razrezov. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1961. 147 p. (MIRA 14:12)

(Coal mines and mining—Standards) (Wages)

NIKOL'SKIY, Viktor Sergeyevich; TYURIN, Mikhail Alekseyevich; SUKOVA, V.A., red. izd-va; HINSKER, A.I., tekhn. red.

[Guide for workers of coal preparation and briqueting plants] Pamiatka dlia rabochikh obogatitel'nykh i briketnykh fabrik. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po gornomu delu, 1961. 163 p. (MIRA 14:12)

(Coal preparation plants) (Briquets (Fuel)) (Wages)

NIKOL'SKIY, Viktor Sergeyevich; TYURIN, Mikhail Alekseyevich; SUKOVA, V.A., red. izd-va; KINSKER, L.I., tekhn. red.

[Handbook for underground workers in coal and shale mines] Pamiatka dlia rabochikh, zaniatykh na podzemnykh rabotakh v ugol'nykh i slantsevykh shakhtakh. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po gornomu delu, 1961. 170 p. (MIRA 14:9)
(Coal mines and mining)

SELYANIN, Vitaliy Georgiyevich, kand. tekhn. nauk; SHOLOMOVICH, Abram Mikhaylovich, inzh. Prinimal uchastiye VARSHAVSKIY, A.M., kand. tekhn. nauk; BOYKO, A.A., retsenzent; NIKOL'SKIY, V.S., otv. red.; POKROVSKAYA, I.M., red.izd-va; IL'INSKAYA, G.M., tekhn. red.; PROZOROVSKAYA, V.L., tekhn. red.

[Reducing labor consuming operations in open pit mines] Snizhenie trudoemkosti rabot na kar'erakh. Moskva, Izd-vo "Nedra," 1964. 213 p. (MIRA 17:3)

NIKOL'SKIY, Viktor Sergeyevich [deceased]; CHETYRKIN, Mikhail Ivanovich;

[Organization of labor and wages in mines; a reference aid] Organizatsiia truda i zarabotnoi platy na shakhtakh; spravochnoe posobie. 2. perer. i dop. izd. Moskva, Nedra, 1965. 288 p. (MIRA 18:3)

NIKOL'SKIY, V.S.

Work practices in a veterinary laboratory. Veterinar'ia 41 no.12: 4-6 D '64. (MIRA 18:9)

1. Direktor Vinnitskoy veterinarnoy laboratorii.

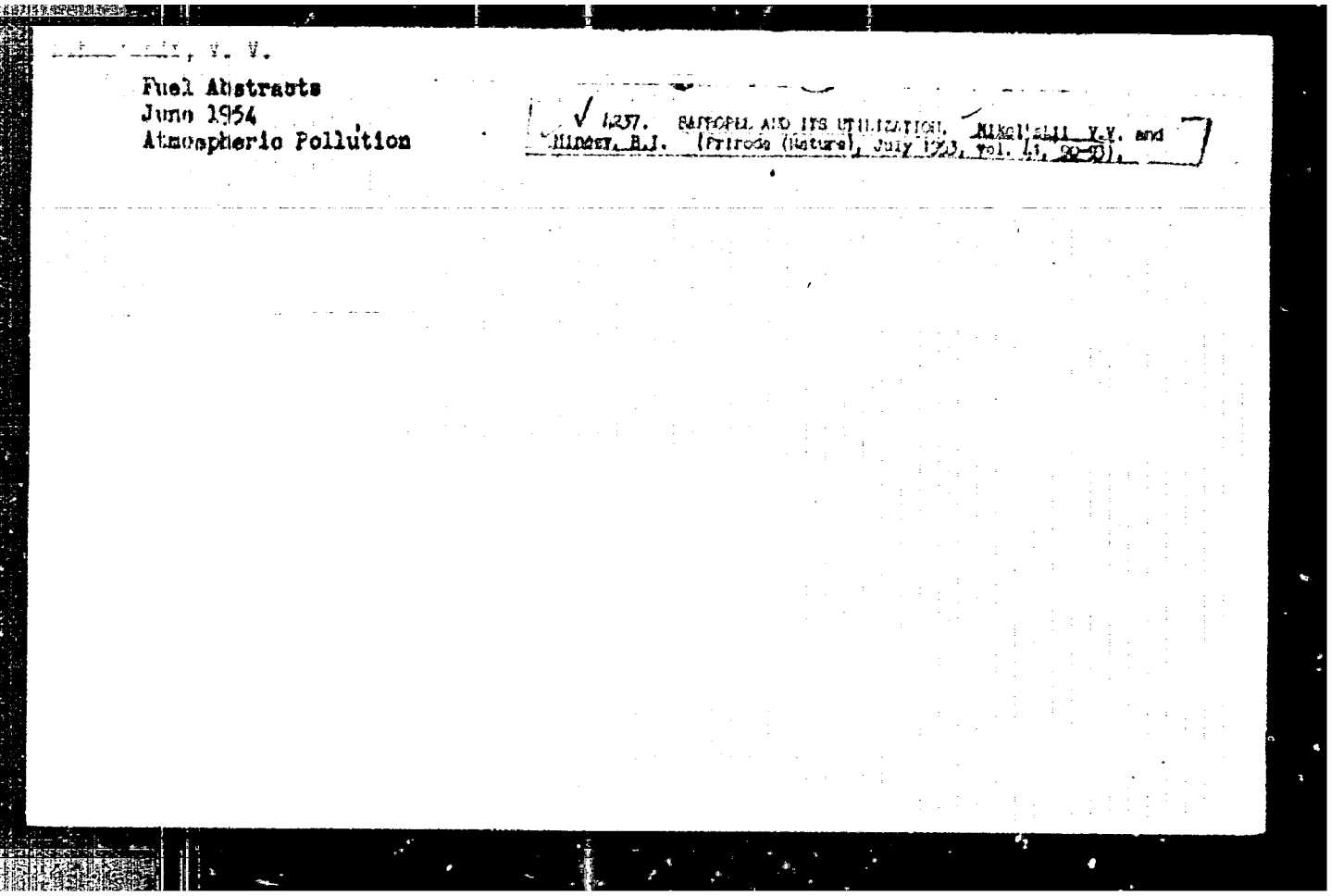
NIKOL'SKIY, V.V.

Clinical and surgical considerations on the treatment of trigeminal neuralgia by resection of trigeminal nerve root. Vopr. neirokhir. 16 no. 4:3-7 July-Aug 1952. (CIML 23:3)

1. Professor. 2. Of the Clinic for Nervous Diseases and Neurosurgery (Head — Prof. V. A. Nikol'skiy), Rostov Medical Institute.

DOMNIOVSKAYA, Nina Maksimovna. Prinimal uchastiye NIKOL'SKIY, V.V., kand. tekhn.nauk, dots.; LYAPKINA, T.G., red.; VOLOKINA, R.K., tekhn. red.

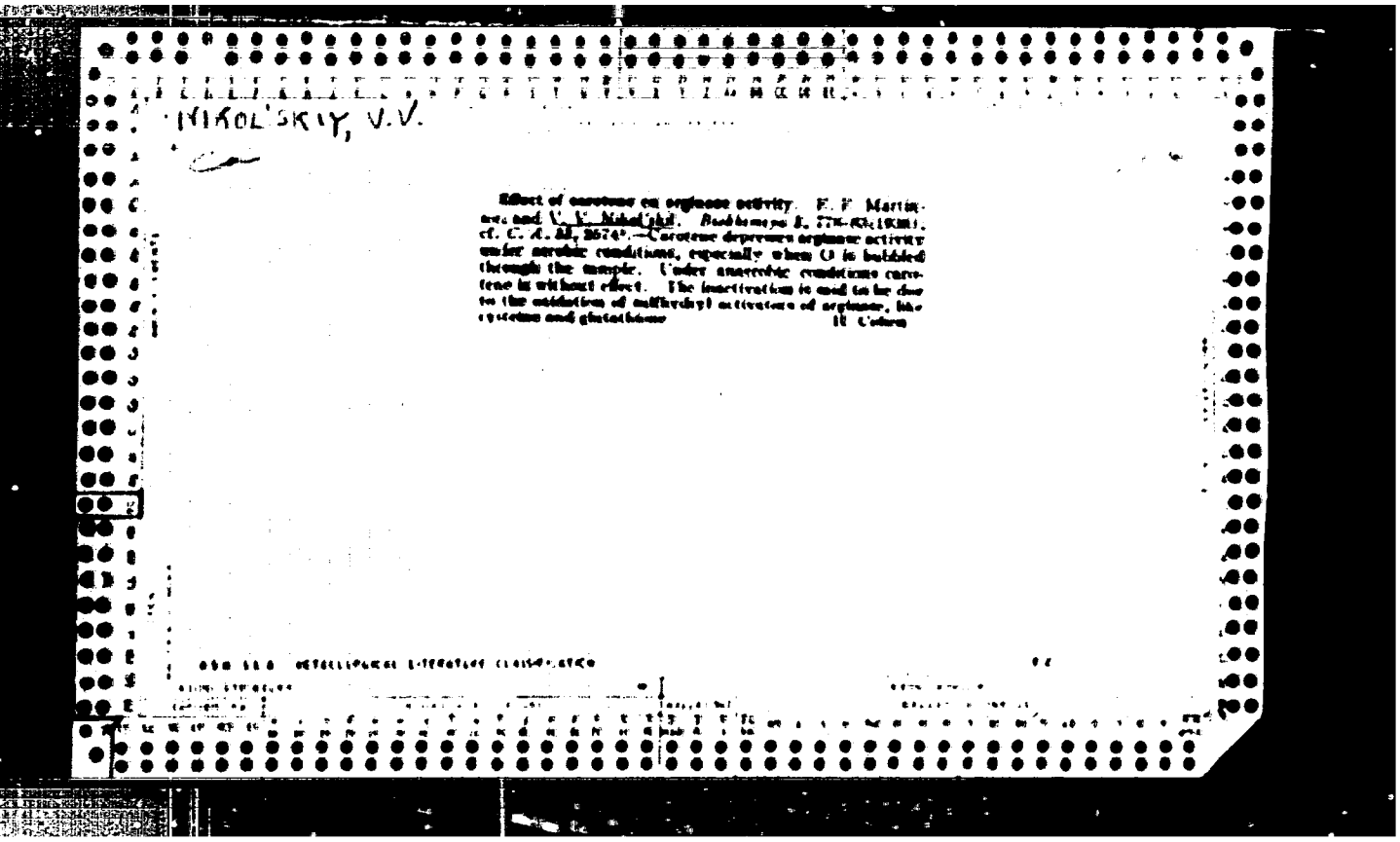
[Radio engineering reader in German]Khrestomatiia po radiotekhnike na nemetskom iazyke; posobie dlia studentov, izuchaiushchikh inostrannyi iazyk. Moskva, Vysshaia shkola, 1961. 74 p. (MIRA 15:11)
(Radio)



[illegible], V. V.

Fuel Abstracts
June 1954
Atmospheric Pollution

√ 1237. RAINFALL AND ITS UTILIZATION. Mikeladzé, V.V. and Hilmey, B.J. (Priroda (Nature), July 1953, Vol. 11, 98-99).



NIKOL'SKIY, V.V.

Effect of carotene on arginase activity. F. F. Martinez and V. V. Nikol'skii. *Biokhimiya* 8, 275-80 (1943). cf. C. A. 38, 2574⁶.—Carotene depresses arginase activity under aerobic conditions, especially when O is bubbled through the sample. Under anaerobic conditions carotene is without effect. The inactivation is said to be due to the oxidation of sulfhydryl activators of arginase, like cysteine and glutathione. H. Colora

NIKOL'SKIY, V.V.

CA

11A

Effect of oxygen on the activity of arginase. [illegible]
Nikol'skii. Byull. Eksptl. Biol. Med. 14, No. 8, 76-7
([illegible]).—There are apparently at least 2 types of liver
arginase; one contains firmly bound Mn, the other has a
rather labile bond with Mn. The former is stable to ac-
tion of O; the latter is significantly deactivated by action
of O. Addn. of Mn ions ($MnCl_2$) serves to reactivate the
enzyme. G. M. Kosolapoff

METALLURGICAL LITERATURE CLASSIFICATION

NIKOL'SKIY, V. V.

Nikol'skiy, V. V. "The effect of hexanal anesthesia on the oxygen content in the blood", Sbornik nauch. trudov kurorta Saki, Vol. IV, 1948, p. 135-37.

So: U-3261, 10 April 1953 (Letopis 'Zhurnal 'nykh Statey, No. 12, 1949).

NIKOL'SKIY, V. V.

Nikol'skiy, V.V., Zalesskaya, M.A., and Chukrayeva, N.I. "The dynamics of RW changes and the albumen content in discharges of gonorrhea patients under the influence of penicillin and sulfadin therapy", Sbornik nauch. trudov (Rost. obl. nauch.-issled. akushersko-g nekol. in-t), Issue 8, 1948, p. 88-94.

So: U-3261, 10 April (Letopis 'Zhurnal 'nykh Stat y, No. 12, 1949).
1953

NIKOL'SKIY, V. V.

Sidorov, P. P. and Nikol'skiy, V. V. "The study of vitamin B_1 as a pain-reducing and accelerating factor in normal labor", Sbornik nauch. trudov (Rost. obl. nauch.-issled. akushersko-ginekol. in-t), Issue 8, 1948, P. 118-26

[redacted], V. V.

Krasnyanskiy, L. M., Nikol'skiy, V. V. and Skuhomlinov, V. F. "On the methodology of determining abortive portions of the uterus", Sbornik nauch. trudov (Rost. obl. nauch.-issled. akusherske-ginekol. in-t)., Issue 8, 1948, p. 168-72.

SO: U-3261, 10 April 1953 (Letopis 'Zhurnal 'nykh Statey, No. 12, 1949).

USSR/Biology - Malt, Enzymes From Sep/Oct 49
Diphosphopyridine

"Some Data on Thiaminpyrophosphatase From Malt," V. V. Rikal'skiy, A. I. Severina, Chair of Biochem, Rostov Med Inst, 5 pp

"Biokhim" XIV, No 5

Intergrown barley contains large quantity of active ferments which split up co-carboxylase into thiamine. This ferment became a salt after its solution form is treated with 35% concentrate of ammonia sulfate solution. Ferment thus obtained

15773

USSR/Biology - Malt, Enzymes From Sep/Oct 49
(Contd)

does not only act on co-carboxylase, but has ability to convert thiamine into product which cannot be obtained by oxidation of thiochrome. Submitted 3 Dec 48.

15773

NIKOL'SKIY, V.V.; POVERENNYI, A.M.

Barfoed's reaction. Biokhimiia, Moskva 17 no.3:317-319 May-June 1952. (CIML 25:1)

1. Department of Biochemistry, Kostov Medical Institute.

USSR/Medicine - Toxins, Choline Esters Jun 53

"Changes in the Lipids of the Brain Under the Action of the Toxin of B. Perfringens," A. M. Poverennyy, S. Ye. Ol'shteyn, V. V. Nikol'skiy, Chair of Biochem and Chair of Microbiol, Rostov State Med Inst

Ukrain Biokhim Zhur, Vol 25, No 2, pp 127-131

The hemolytic fraction of the toxin of B. perfringens (I) is resorbed more easily by brain tissue than by any other tissue. Under the action of the toxin of I, the quantity of all lipids except diaminophosphatides increases in the brain. The P content of ether-soluble lipids increases, possibly due to their high content of phosphorylcholine formed at the site of the affection or in blood due to the action of the lecithibase of I on lecithin. As a result of a specific reaction of nerve tissue to the toxin of I, the content of cerebrosides increases.

PA 25/T32

(CA 47 no. 22:12595 '53)

NIKOL'SKIY, V. V.

NIKOL'SKIY, V. V.: "On the origin and role of the high-molecular aliphatic acids (C_{24}) in the animal organism." Rostov State Medical Inst. Rostov na Donu, 1956, (Dissertation for the Degree of Doctor in Medical Sciences)

Source: Knizhnaya letopis' No. 28 1956 Moscow

KIRDL'SKIY, V.V.; KUKOVALEVA, N.A.; CHUMAKOVA, L.M.

Effect of ionising radiation on the lipid composition of the blood and liver in rats. Vop.biokhim.strur. 31 no.6:877-882 '59.
(MIRA 13:5)

1. Department of Biochemistry and Department of Roentgenology and Radiology of the Rostov-na-Donu Medical Institute.
(LIPIDS) (RADIATION--PHYSIOLOGICAL EFFECT)

NIKOL'SKIY, V.V.; NEKOVALEVA, N.A.; CHUMAKOVA, L.M.

Dynamics of unsaturated fatty acids of the blood in patients subjected to radiotherapy. Med. rad. 5 no.12:13-17 '60. (MIRA 14:3)

(FATTY ACIDS) (RADIATION—PHYSIOLOGICAL EFFECT)

NIKOVALEVA, N.A.; NIKOL'SKIY, V.V.; CHUMAKOVA, L.M.

Studies of fatty acids in the blood of normal subjects. Vop. med.khim. 6 no.1:25-28 Ja-F '60. (MIRA 13:5)

1. Chair of Biochemistry of the Rostov Medical Institute.
(FATTY ACIDS blood)

NIKOL'SKIY, V.V.; KUBTSOVA, G.V.

Effect of X-irradiation on the formation of pancreatic enzymes.
Vop.med.khim. 6 no.4:365-368 Jl-Ag '60. (MIRA 14:3)

1. Chair of Biochemistry and Chair of Radiology, Rostov Medical Institute.
(PANCREAS—SECRETIONS) (X RAYS—PHYSIOLOGICAL EFFECT)

NIKOL'SKIY, V.V.

Simplified method for the synthesis of α-ketoglutaric acid.
Lab.delo 9 no.3:29-30 Mr '63. (MIRA 16:4)

1. Kafedra biokhimii Rostovskogo meditsinskogo instituta.
(GLUTARIC ACID)

LIVSHITS, M.S.; NIKOL'SKIY, V.V.; SUKHOV, V.G.

Self-adjoint operator method in the theory of waveguides. Radiotekh. i elektron. 8 no.10:1798 O '63. (MIRA 16:10)

NIKOL'SKIY, V.V., doktor tekhn.nauk

Present state of the formulation of problems in electrodynamics.
Trudy VZEI no.26:24-37 '61. (MIRA 18:6)

ACCESSION NR: AP5000092 UR/0109/65/010/004/0618/0625 43 B

AUTHOR: Nikol'skiy, V. V.; Sukhov, V. G.; Korniyenko, D. I.; Orlov, V. P.

TITLE: Designing a rectangular waveguide containing a longitudinally-magnetized ferrite by the eigen-function method

SOURCE: Radiotekhnika i elektronika, v. 10, no. 4, 1965, 618-625

TOPIC TAGS: rectangular waveguide, waveguide, ferrite waveguide

ABSTRACT: This is a continuation of a previous authors' work (Rad. i elektronika, 1964, v. 9, no. 8, 1345); this article presents a physical interpretation of the theoretical results and some calculations of a waveguide containing one centrally located ferrite bar. The propagation constants are real for quasi-H_{10} and quasi-H_{01} modes; the propagation constants for these and other propagating modes are tabulated. The quasi-H_{10} and quasi-H_{01} modes are elliptically polarized with opposite directions of rotation; the ellipticity depends

ACCESSION NR: AP5010092

...e ferrite size and parameters and is not constant over the cross-section ... similarity of physical processes in the rectangular-waveguide ferrite ... shifter and the circular-waveguide Faraday polarization-plane rotator is ...ated. Construction of the ferrite phase-shifter, its reciprocity characteris... ...e, and Q-factor are described. Orig. art. has: 6 figures and 2 tables.

...ATION: none

...MITTED: 09Mar64 ENCL: 00 SUB CODE: EC

...REF SOV: 001 OTHER: 001

1/1

L 7813-66 EWT(d)/EWT(l)/T/EWA(h) IJP(c)
ACC NR: AP5027622 SOURCE CODE: UR/0109/65/010/011/1992/1999

AUTHOR: Nikol'skiy, V. V.; Sukhov, V. G.; Korniyenko, D. I.; Orlov, V. P.

ORG: none

TITLE: Calculation of a rectangular waveguide filled with ferrite or ferrite and dielectric and magnetized longitudinally

SOURCE: Radiotekhnika i elektronika, v. 10, no. 11, 1965, 1992-1999

TOPIC TAGS: rectangular waveguide, ferrite layer waveguide, dielectric layer waveguide

ABSTRACT: The method of eigen-functions used by the authors for designing rectangular waveguides containing ferrite rods (Rad. i elektronika, 1964, 9, 8, 1345, and 1965, 10, 4, 618) is extended over these configurations: two ferrite strips adjoining the wider walls of the waveguide; same, adjoining the narrower

Card 1/2

UDC: 621.372.853.2.001.24

L 7813-66
ACC NR: AP5027622

walls; ferrite rod in a waveguide filled with a dielectric of $\varepsilon \neq 1$; hollow ferrite rod; dielectric strip between two ferrite strips; ferrite strip between two dielectric strips. Curves of the propagation constant, losses, etc., for quasi-TE_{01} and quasi-TE_{10} modes calculated on a digital computer are presented. The mathematical interpretation of the electric and magnetic fields in a ferrite-containing waveguide is discussed. Orig. art. has: 8 figures, 3 formulas, and 4 tables.

SUB CODE: 09 / SUBM DATE: 20Jul64 / ORIG REF: 003

Card 2/2

ACC NR: AM6026700 Monograph UR/

Nikol'skiy, Vyacheslav Vladimirovich

Antennas (Antenny) Moscow, Izd-vo "Svyaz'", 1966. 368 p. illus., biblio., tables. Errata slip inserted. 15,000 copies printed. Textbook for students studying at electrotechnical institutes of communications.

TOPIC TAGS: antenna, antenna theory, antenna radiation pattern, antenna configuration, antenna engineering

PURPOSE AND COVERAGE: This book has been approved by the USSR Ministry of Communications for use as a textbook in radio engineering institutes. The book contains standard material on the course "Antennas and feeders". The principles of designing multi-purpose and multi-waveband antennas are stressed. The usual theoretical problems such as principles of electrodynamics, elementary radiators, equivalent circuits, waveguides, and others have been eliminated in this volume. S. A. Shipkov read the manuscript, V. I. Fel'dsher prepared a number of graphs, G. Z. Ayzenberg provided comments and advice, and A. M. Model edited the book.

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ACC NR: AM6026780

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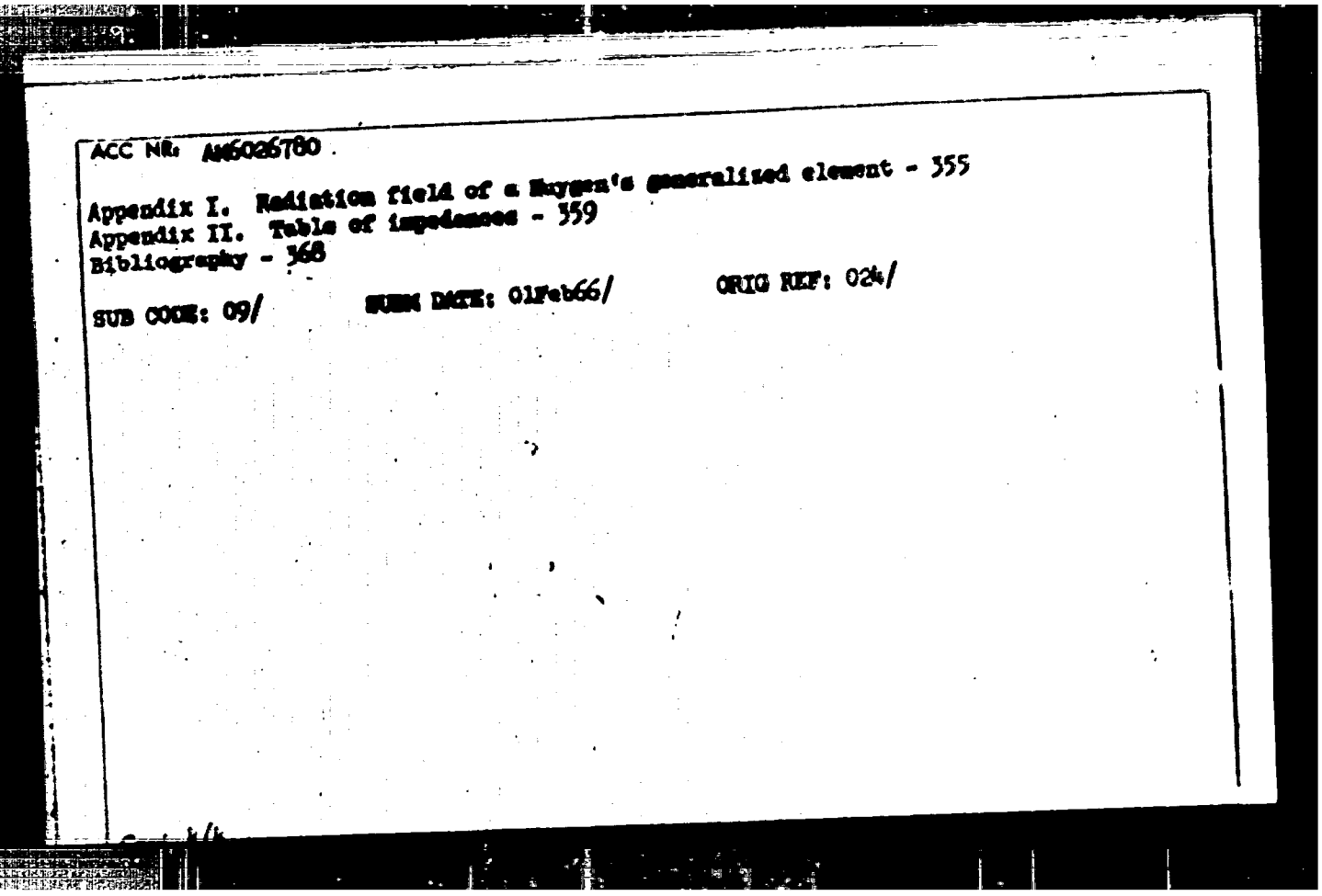

ACC NR: AM6026780

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SUB CODE: 09/ SUBM DATE: 01Feb66/ ORIG REF: 024/

USSR / Farm Animals. Cattle. Q-6

Abs Jour: Ref Zhur-Biol., No 12, 1958, 54748.

Author : Nikol'skiy V. V., Syuzyumova, L. M.
Inst : Not given.
Title : On the Effect of Yeast Obtained by Hydrolysis upon the Immunological Reactivity of Calves.

Orig Pub: Tr. In-ta biol. Ural'skiy fil. AN SSSR, 1957, vyp. 4, 135-139.

Abstract: The administration of hydrolyzed yeast in doses of 50 to 240 g. daily, between one month and six months of age, exerted a favorable effect on the growth and development of calves. The average daily weight gain of the experimental animals exceeded by 100 to 120 g. that of the calves in the control group. The calves of the experimental group reacted to the reiterated injection of the paratyphoid formol-vaccine by a higher titer of agglutinins.

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22

NIKOL'SKIY, V.V., professor, doktor veterinarnykh nauk; SYUKYUMOVA, L.M., [redacted] sotrudnik; KOSYREVA, L.A., aspirant.

Natural immunity of calves to diseases. Veterinariia 34 no.1: 29-34 Ja '57. (MLRA 10:2)

1. Institut biologii Ural'skogo filiala Akademii nauk SSSR.
(Calves) (Immunity)

NIKOL'SKIY, V.V.; TRIFONOVA, A., prof., otvetstvenny red.; IZMOZHKOVA, L.A., red.

[Natural disease resistance in calves and ways of increasing it] O prirode estestvennoi rezistentnosti organizma teliat k zabolevaniiam i putiakh ee povysheniia. Sverdlovsk, 1958. 111p. (Akademiia nauk SSSR. Ural'skii filial, Sverdlovsk. Institut biologii. Trudy, no.10) (MIRA 11:12)
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"Infektsyia ta Immunologichna Reaktivnost' Tvarinnogo Organizmu" Kiev, Izdatel'stvo Ukrainskoi Akademii Sel'skokhoziaistvennykh Nauk, 144 pages; 1,100 copies."

Veterinariya, Vol. 38, No. 1, p. 91, 1961.

NIKOL'SKIY, V. V., REVENKO, I. P., NASTENKO, K. A. and GAIDAMAKA, T. V. (Corresponding Member of UASKHN [Ukrainian Academy of Agricultural Sciences], Professor, Candidates of Veterinary Sciences and Candidate of Biological Sciences, UASKHN).

Infectious gastroenteritis of swine

Veterinariya, Vol. 38, No. 8, August 1961, pp. 30

NIKOL'SKIY, Vladimir Vasil'yevich, prof.; [illegible], V.N., red.

[Infectious (virus) gastroenteritis of swine] Infektsionnyi (virusnyi) gastroenterit svinei. Kiev, Izd-vo Urozhai," 1964. 61 p. (MIRA 17:9)

NIKOL'SKIY, V.V., prof.; REVENKO, I.P., kand. veterin. nauk; NASTENKO, K.A., kand. veterin. nauk; GAYDAMAKA, T.V., kand. biolog. nauk

Infectious gastroenteritis in swine. Veterinariia 38 no.8:30-33 Ag '61 (MIRA 18:1)

1. Ukrainskaya akademiya sel'skokhozyaystvennykh nauk. 2. Chlen korrespondent Ukrainskoy akademii sel'skokhozyaystvennykh nauk (for Nikol'skiy).

OSADCHAYA, Ye.F., aspirant; NIKOL'SKIY, V.V., prof., nauchnyy rukovoditel' raboty

Excretion of cytopathogenic agents b carp during the acute form of hemorrhagic septicemia. Veterinariia 41 no.9:29 S '64. (MIRA 18:4)

1. Ukrainskaya ordena Trudovogo Krasnogo Znameni sel'skokhozyaystvennaya akademiya.

NIKOL'SKIY, V. V.

Nikol'skiy, V. V. -- "Measurement of the Tensor of Magnetic Permeability and Dielectric Permeability of Ferrites." Min Higher Education USSR. Moscow Order of Lenin Aviation Inst imeni Sergo Ordzhonikidze. Moscow, 1956. (Dissertation for the Degree of Candidate in Technical Science)

So; Knizhnaya Letopis', No 12, 1956

NIKOL'SKIY, V.V.

I-7

USSR / Radiophysics. Radio Measurements.

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12584

Author : Nikol'skiy, V.V.

Inst : Not given

Title : Measurements of the Parameters of Ferrites at Microwave Frequencies. Parts I and II.

Orig Pub : Radiotekhnika i elektronika, 1956, 1, No 4, 447-468

Abstract : The author considers the problem of the measurement of all components of the magnetic permeability tensor μ and of the dielectric-constant tensor ε of a ferrite from the increment in the natural frequency and bandwidth of the cavity resonator (its complex natural frequency). For this purpose, it is necessary in principle to obtain four independent complex increments. The variation of the conditions is reached by

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USSR / Radiophysics. Radio Measurements.

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12584

placing the ferrite specimen in various portions of the resonant and measuring the direction of the magnetizing field H_0. It is desirable that each reaction of the resonator depend on the minimum number of quantities to be determined. For this purpose, the specimen should be small relative to one or several dimensions (for example, a thin plate, a thin cylinder, a small sphere). These types of specimens are analyzed from the point of view of simplicity and intensity of the resonator reaction that they produce. The principle of perturbation of the resonator is generalized to include gyrotropic media. With this, a rigorous formula is obtained connecting the increment in its natural complex frequency with the parameters of the perturbation region and with the vectors of the initial and perturbed fields. The formula is applied to the measurement problem.

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I-7

USSR / Radiophysics. Radio Measurements

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12584

USSR / Radiophysics. Radio Measurements.

Abs Jour : Ref Zhur - Fizika, No 5, 1957, No 12584

Calculations are given, along with formulas, for these cases. The problem of the permissible diameter of the cylindrical specimen is investigated. Data are given on the construction of resonators that can be adapted for the measurement of all the parameters of cylindrical ferrite specimen. The resultant experimental curves show that the discrepancy between the measurement results of the components of μ and ε, when using the resonators, do not exceed 10 percent.

Card : 5/5

NIKOL'SKIY, V.V.

109-7-3/17

AUTHOR: Nikol'skiy, V.V.

TITLE: Calculation of the Phase Shifts of Gyrotropic Discontinuities in Wave Guides by means of the Perturbation Method. (Raschet fasovykh sdvigov girotropnykh neodnorodnostey v volnovode metodom vozmushcheniya).

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, Nr 7, pp.833-842 (USSR)

ABSTRACT: The principle of the method has been considered and generalised to include gyrotropic media in a number of authors' works (Refs.2, 3, 4, 5 and 6). In the present work the method is applied to the problems of gyrotropic discontinuities in waveguides. An analysis is carried out under the assumption of the so-called quasi-stationary approximation which limits the dimensions of the gyrotropic regions to values lower than the wavelength of the system. The waveguide considered (shown in Fig.1) has a gyrotropic discontinuity V_1 which disturbs its regularity. It is assumed that initially the fields in the waveguides are $\vec{E}_0$ and $\vec{H}_0$ and that its permittivity and permeability are ε_0 and μ_0. In the perturbed state the fields are $\vec{E}$ and $\vec{H}$ and the permittivity and permeability are expressed tensorially (as given by Eqs. (1)). The transmission coefficient of the system can then

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...ised longitudinally (Fig.26,

Calculation of the Phase Shifts of Gyrotropic Discontinuities in Waveguides by means of the Perturbation Method.

3) A ferrite, horizontal, vertically magnetised rod, Fig.2B, (φ given by Eq.(25)).

4) A ferrite sphere magnetised along any of the 3 axes (Fig.2г), φ given by Eqs.(26) and (28).

5) A ferrite diaphragm either vertical or horizontal (Figs.3a and 3б), φ given by Eqs.(31) and (32).

Similar expressions were derived for a cylindrical waveguide with a diso (Fig.4a, φ given by Eq.(33)) and a ferrite sphere (Fig.4б, φ given by Eq.(35)). The phase shift of a coaxial line with a ferrite ring (Fig.5) is expressed by Eq.(38). The above formulae were employed to determine the phase shifts for some of the systems and the resulting values are shown in the curves of Fig.6. The paper contains 6 figures and 6 references, 5 of which are due to the author.

SUBMITTED: October 9, 1956.

AVAILABLE: Library of Congress.

Card 3/3

NIKOL'SKIY, V.V.

109-8-13/17

AUTHOR: Nikol'skiy, V.V.

TITLE: Determination of the Eigen Values and Functions of Gyrotropic Media by the Method of Successive Approximations. (Nakhozhdeniye sobstvennykh znacheniy i funktsiy girotropnykh sistem metodom posledovatel'nykh priblizheniy)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, Nr 8, pp.1074-1077 (USSR)

ABSTRACT: This paper proposes a method of finding the natural frequencies of cavity resonators and the propagation constants of waveguides, which are partly filled with a gyrotropic or isotropic medium. The method is based on the accurate formula for the perturbation of a cavity resonator or waveguide which was given by the author in his previous works (1, 2 and 3). The formula is in the form:

$$\Omega_n = f_1\left[a_1, A_n(\Omega_n)\right] = f(a, \Omega_n) \qquad (1)$$

where Ω_n is the perturbed eigen value for a waveguide or a resonator, A_n the perturbed eigen functions, a_1 and a

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AUTHOR: Nikol'skiy, V.V. 109-3-5-11/17

TITLE: Determination of the Internal Field in the Perturbation-method Analysis by Solving the Diffraction Problem (Nakhozhdeniye vnutrennego polya v metode vozmushcheniya pri pomoshchi resheniya difraktsionnoy zadachi)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol III, Nr 5, pp 690 - 697 (USSR)

ABSTRACT: A homogeneous plane wave is assumed to impinge on an isotropic cylinder of radius r_1, which is oriented along the axis y. The problem consists of finding the field inside the cylinder (the refracted field). If the electric vector of the incident wave is parallel to the axis of the cylinder, as expressed by Eq.(1), the scattered field and the refracted field are given by Eqs.(3) and (4), respectively; in these equations, $k = \omega\sqrt{\varepsilon\mu}$ and ε and μ are the parameters of the cylinder. The fields have to satisfy the boundary conditions expressed by Eqs.(5), from which it follows that the coefficient b_n can be expressed by Eq.(6). On the basis of the Maxwell equations and Eq.(4), it is shown that the magnetic field inside the cylinder can be expressed by Eq.(7). If it is assumed that the magnetic vector of the incident wave is parallel to the axis of the

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Determination of the Internal Field in the Perturbation-method Analysis by Solving the Diffraction Problem

cylinder, the internal magnetic and electric fields are expressed by Eqs.(8) and (9), respectively, and the unknown coefficient b_n' is given by Eq.(10). If the cylinder is subjected to the action of two waves whose directions of propagation are perpendicular to its axis but differ by an angle 2ϕ and the phase shift between the waves is α, the internal field can be written in the form of Eq.(12). The above equations are used to analyse the behaviour of a vertical isotropic cylinder placed in a rectangular waveguide. The position of the axis of the cylinder in the waveguide is described by co-ordinates $z = z_1$ and $x = x_1$ (see Fig.2).

It is shown that for this case, the field inside the cylinder can be expressed by Eq.(14). It is also shown that the transmission coefficient of the system is expressed by Eq.(18) or approximately by Eq.(16). The above analysis did not take into account the finite conductivity of the walls of the waveguide. This effect can be taken into account if the coefficients a_o and b_o are replaced by corrected coefficients A_o and B_o, which are expressed by Eqs.(21)

Determination of the Internal Field in the Perturbation-method Analysis by Solving the Diffraction Problem

and (22), respectively. The above analytical results were employed to evaluate the transmission coefficient τ for the following system: $\lambda/a = 1.4$, $\varepsilon/\varepsilon_0 = 9$, $d/a = 0$ to 0.2 (where d is the diameter of the cylinder). The values of B_0 as a function of $\pi d/\lambda$ for the above case are shown in Fig.3. Fig. 4 represents the values of the transmission coefficient τ as a function of $\pi d/\lambda$, while Fig.5 represents the values of the coefficients which are proportional to the amplitudes of the field on the surface of a cylinder situated either in free space or in the centre of an H_{10} waveguide.

The paper contains an appendix, 5 figures and 8 Soviet references.

SUBMITTED: December 7, 1956

AVAILABLE: Library of Congress

Card 3/3

1. Waves-Diffraction-Theory

SOV-109-3-6-4/27

AUTHOR: Nikol'skiy, V. V.

TITLE: The Simplest Case of Diffraction of a Plane Wave from a Gyrotropic Cylinder (Prosteyshiy sluchay difraktsii ploskoy volny na girotropnom tsilindre)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 6, pp 756-759 (USSR)

ABSTRACT: The problem is formulated as follows. The axis of an infinite cylinder having a diameter $d = 2r_1$, coincides with axis y. The permittivity and permeability of the cylinder are described by the tensors expressed by Eqs.(1); the parameters of the surrounding medium are ε_o and μ_o.

A plane wave propagating along the axis z impinges on the cylinder. It is necessary to find the field inside the cylinder and the scattered field. If the electric vector of the incident wave is parallel to the axis of the cylinder, the incident wave can be expressed by Eq.(3), where the angle φ is read in the anti-clockwise direction. The internal electric field is given by Eq.(4), while the external field is expressed by Eq.(5). The magnetic vectors of the inner and the scattered fields are then expressed by Eqs.(6) and (7) respectively. The coefficients b_n and a_n of Eqs.(4)

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The Simplest Case of Diffraction of a Plane Wave from a Gyrotropic Cylinder

and (5) can be found from the boundary conditions expressed by Eqs.(8) and are in the form of Eqs.(10 and (11) respectively. If the incident wave is such that its magnetic vector is parallel to the axis of the cylinder, as expressed by Eqs.(12), the internal and the scattered fields are expressed by Eqs.(13), (14), (15) and (16); the unknown coefficients b_n' and a_n' in these equqtions are expressed by Eqs.(17) and (18) respectively. If the diameter of the cylinder is very small, Eq.(6) can be written as Eq.(19) and Eq.(10) is in the form of Eq.(20); from these it follows that the magnetic field inside the cylinder is in the form of Eq.(6a) which is in agreement with the formula obtained by Suhl and Walker (Ref.1). For the case of the incident

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The Simplest Case of Diffraction of a Plane Wave from a Gyrotropic Cylinder

wave having the magnetic vector parallel to the axis of the cylinder, the internal electric field in a thin cylinder is in the form of Eq.(15a). There are no figures and 2 references, one of which is English and one Soviet.

SUBMITTED: January 2, 1957

1. Electromagnetic waves -- Deffraction 2. Electromagnetic waves -- Analysis 3. Cylinders -- Applications

AUTHOR: Nikol'skiy, V. V.

TITLE: A Transverse Ferrite Rod in a Rectangular Waveguide (Poperechnyy ferritovyy sterzhen' v pryamougol'nom volnovode)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 6, pp 826-828 (USSR)

ABSTRACT: The problem of a magnetised ferrite cylinder, parallel to the electrical vector of the H_{10}-wave in a rectangular waveguide was dealt with approximately in a number of works (Refs. 1 and 2). Here the problem is considered more accurately (the second approximation) and the solution is suitable for engineering applications. The electrical field of an H_{10}-wave impinging on a cylinder (see Fig.1) can be expressed by (Ref.3) Eq.(1), where :

$\kappa_0 = \omega\sqrt{\varepsilon_0\mu_0}$; $\chi = \pi/a$; ϑ = arc cos$(\lambda/2a)$ and $\sin\vartheta = |\Gamma|/\kappa_0$ .For practical applications only the first terms of the above expansion are necessary so that the field is given by Eq.(2). The fields inside the cylinder and the scattered field (without taking into account the effect of the waveguide walls) can be expressed by (Ref.4) Eqs.(3).

SOV/109-3-9-12/20

AUTHOR: Nikol'skiy, V. V.

TITLE: The Variational Principle as Applied to the Non- Absorptive Gyrotropic Discontinuity in a Waveguide (Variatsionnyy printsip dlya nepogloshchayushchey girotropnoy neodnorodnosti v volnovode)

PERIODICAL: Radiotekhnika i elektronika, 1958, Vol 3, Nr 9, pp 1207-1209 (USSR)

ABSTRACT: The system considered is represented in the diagram on p 1207. On the basis of the Poynting theorem, for the space limited by the two cross-sections S' and S" (see the figure), it is possible to write two integrals in the form of Eqs.(1) and (2), in which S is the surface enclosing the considered volume V , while μ and ϵ are the tensors of the medium. Since the principal waves of the type E_i and H_i fulfil the conditions expressed by Eqs.(3) at the two cross-sections, it is possible to write Eqs.(1) and (2) in the form of Eqs.(4) and (5), where ρ and τ represent the reflection coefficient and the transmission coefficient of the system, respectively. If the losses in the region V are negligible, Eqs.(1) and (2) result in Eqs.(8) and (9), where Σ and ϕ are given

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The Variational Principle as Applied to the Absorptive Gyrotropic Discontinuity in a Waveguide

by Eqs.(10) and (11). Expressions (7), (8) and (9) permit the determination of r and τ since the functionals Φ and ϕ assume extreme values, if the losses in the region V are negligible. The paper contains 1 figure and 1 English reference.

SUBMITTED: July 5, 1957.

Card 2/2

SOV/109-3-12-11/13

AUTHOR: Nikol'skiy, V.V.

TITLE: The Problem of Non-homogeneous Gyrotropic Media (K voprosu o neodnorodnykh girotropnykh sredakh)

PERIODICAL: Radiotekhnika i Elektronika, 1958, Vol 3, Nr 12, pp 1518 - 1520 (USSR)

ABSTRACT: The paper deals with an ultra-high frequency model of a medium which is in the form of porous ferrite or dielectric containing ferrite particles. The model is in the form of a system of spheres which are uniformly distributed in a filler (see the figure on p 1519). The spheres are small in comparison with the wavelength and therefore the problem can be solved by using the perturbation method in the quasi-stationary approximation. It is assumed that the material is situated between two parallel planes and forms a resonator. The problem consists of determining the change in the natural frequency of the resonator when spherical "impurities" are introduced in between the planes. If the magnetic perturbation alone is considered, the frequency change can be expressed by Eq (1) (Ref 1); H_0 in Eq (1) denotes the initial magnetic field, V is the volume of the resonator and

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The Problem of Non-homogeneous Gyrotropic Media

μ and k are the components of the permeability tensor of the ferrite. From Eq (1) it is found that the change in frequency can also be expressed as Eq (4), where μ_1 is the permeability of the dielectric in the resonator. Since the frequency change can also be expressed in terms of the components of the tensor of the equivalent permeability (see Eq (6)), it is shown that these components are given by Eqs (7) and (8). Similarly, the third component of the equivalent tensor is expressed by Eq (9). The problem of a porous ferrite can be solved in the same way and it is shown that the equivalent tensor parameters are expressed by Eqs (11), (12), (13) and (14), where ϵ_o , μ_o are the permittivity and permeability of vacuum. There are 1 figure and 2 Soviet references.

SUBMITTED: July 2, 1957

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SOV/109-4-4-21/24

AUTHOR: Nikol'skiy, V.V.

TITLE: On the Theory of an UHF Ferrite Amplifier (K teorii SVCh-usilitelya na ferrite)

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 4, pp 726 - 728 (USSR)

ABSTRACT: The paper considers one of the possible principles of constructing an UHF amplifier employing a ferrite material. It is assumed that the homogeneous motion of the magnetisation in a ferrite, when subjected to the action of the field, is expressed by:

$$\vec{H} = H_{=}\vec{z}_o + 2\vec{h}_1 \cos(\omega t + \varphi_1) + 2\vec{h}_2 \cos(2\omega t + \varphi_2) \qquad (1) .$$

The magnetisation is expressed by Eq (2) and the equation of motion is in the form of Eq (3). If the expression for the magnetisation is substituted into the equation of motion six equations are obtained. These are represented by Eqs (5a) and (6). The equations can be employed to investigate the conditions inside a cavity resonator. Thus when a piece of ferrite is placed in the cavity, the complex

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frequency of the resonator undergoes a change which is expressed by Eq (7). This equation is employed to investigate a rectangular resonator with a transverse ferrite plate; this is shown in Figure 2. The frequency change for this system is expressed by Eq (8). The quality factor of this system can, therefore, be expressed by Eq (10), where:

$$\mu_1 = (\mu^2 - k^2) / \mu .$$

From Eq (10), it follows that for $\vartheta = 0$ or $\vartheta = \pi/2$ the system is non-regenerative. The condition of regeneration or self-excitation is obtained when the denominator of Eq (10) is made equal to zero. The system can, therefore, be used as an amplifier; for this purpose, it should be modified in accordance with the diagram of Figure 3.

NIKOL'SKIY, Vyacheslav Vladimirovich; FEDOROV, N.N., dots., retsenzent; TENKOVSKAYA, G.Ye., red.

[Electromagnetic field theory] Teoriia elektromagnitnogo polia. Izd.3. Moskva, Vysshaia shkola, 1964. 383 p. (MIRA 18:3)

NIKOL'SKIY, V.V.; GUREVICH, A.G., kand.tekhn.nauk, retsenzent; MYALIK, A.M., red.

[Theory of the electromagnetic field; manual for students of radio engineering] Teoriia elektromagnitnogo polia; uchebnoe posobie dlia studentov radiotekhnicheskogo fakul'tetа. Moskva, Gos.energ.izd-vo, 1960. 430 p. (MIRA 14:1)
(Radio--Handbooks, manuals, etc.)
(Electromagnetic theory)

2,4220

SOV/109-5-1-8/29

AUTHOR: Nikol'skiy, V. V.

TITLE: On Slow Waves in a Gyrotropic Medium

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 1, pp 39-45 (USSR)

ABSTRACT: In the study it is shown that sufficiently slow waves spreading in gyromagnetic rods (free, placed in a pipe, etc) and satisfying Eq. (3) may be considered as "magnetostatic" waves. The equation:

$$\nabla^2\psi + \frac{\mu^2}{\mu}\frac{\partial^2\psi}{\partial z^2} = 0, \qquad (3)$$

is given by L. R. Walker for the case of symmetrical magnetization, where μ and μ_3 are tensor components and

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On Slow Waves in a [illegible]

SOV/109-5-1-4/20

$$\hat{\mu} = \begin{bmatrix} \mu & -j\kappa & 0 \\ j\kappa & \mu & 0 \\ 0 & 0 & \mu_0 \end{bmatrix} \qquad (4)$$

Walker has derived Eq. (3) from the expression for the magnetic field potential given in the form:

$$\vec{H} = \text{grad}\,\psi \qquad (2)$$

Considering a longitudinally homogeneous system, for instance an endless thin gyrotropic rod, and assuming for this case:

$$\partial/\partial z = -jk,$$

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Eq. (3) may be rewritten in the form:

$$\nabla_1^2\psi - \frac{\mu_0}{\mu}\Gamma^2\psi = 0. \qquad (5)$$

The solution of Eq. (5) is:

$$\psi = A\psi^+ e^{-j\Gamma z} + B\psi^- e^{j\Gamma z} \qquad (6)$$

For real Γ, Eq. (6) shows a superposition at waves which, on the basis of Eq. (2), may be called magnetostatic. (1) Slow electromagnetic waves in a gyrotropic medium. The solution of Maxwell equations, which characterize the wave:

$$\vec{E} = \vec{E}_0 e^{-j\Gamma z}, \quad \vec{H} = \vec{H}_0 e^{-j\Gamma z}. \qquad (7)$$

spreading in a gyrotropic (more exactly, gyromagnetic) medium in the direction of constant magnetization, may be written in the form:

$$\vec{E}^{(1,2)} = \begin{bmatrix} -i\frac{k}{\mu}\Gamma & \varkappa_{1,2}^2 - \Gamma^2 - \omega^2\varepsilon_- & 0 \\ -\varkappa_{1,2}^2 + \Gamma^2 - \omega^2\varepsilon_{(1,2)} & i\frac{k}{\mu}\Gamma & 0 \\ 0 & 0 & -i\frac{k}{\mu}\varkappa_{1,2}^2 \end{bmatrix} \operatorname{grad} \psi^{(1,2)}, \quad (15a)$$

$$\vec{H}^{(1,2)} = -\frac{\Gamma}{i\omega\mu} \times$$

$$\times \begin{bmatrix} \varkappa_{1,2}^2 + \Gamma^2 - \omega^2\varepsilon_+ & -i\mu\omega\varepsilon_a & 0 \\ i\mu\omega\varepsilon_a & \varkappa_{1,2}^2 + \Gamma^2 - \omega^2\varepsilon_- & 0 \\ 0 & 0 & -\frac{\varepsilon_+(\varkappa_{1,2})^2}{\varepsilon_a}\varkappa_{1,2}^2 + \Gamma^2 - \omega^2\varepsilon_+ \end{bmatrix} \operatorname{grad} \psi^{(1,2)}, \quad (15b)$$

where the scalar function:

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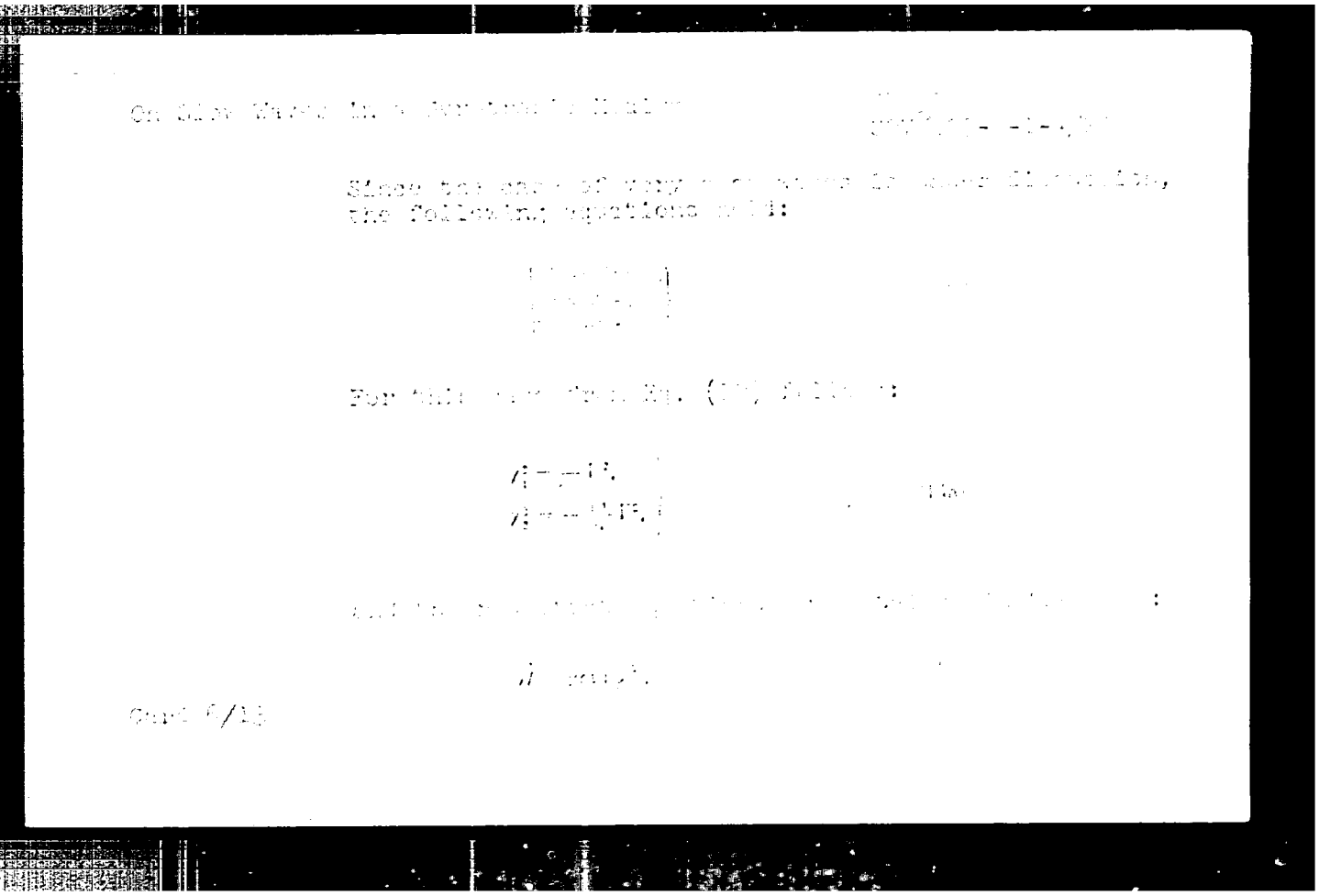

and

$$\nabla_{\perp}^2 \psi_0^{(2)} - \frac{\mu_a}{\mu} \Gamma^2 \psi_0^{(2)} = 0. \qquad (17)$$

Eqs. (16) and (17) are similar to Eqs. (2) and (5). From it results that the magnetic field of the slow wave under investigation may be considered as a magnetostatic wave. Its propagation constant Γ is given in the form:

$$\Gamma = \pm j\chi_2 \sqrt{\frac{\mu}{\mu_a}}. \qquad (18)$$

(2) Gyrotropic cylinder with an ideally conducting shell. In this case the scalar function $\psi_0^{(2)}$ is given in the form:

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$$\psi_0^{(2)} = J_n(\gamma_2 r)\cos n\varphi \qquad (19)$$

The scalar function $\psi_0^{(2)}$ is subordinated to the following boundary limits condition:

$$(\bar{n}\,\mathrm{grad}\,\psi_0^{(2)})_{r=R} = 0, \qquad (20)$$

where R is a radius of the cylinder. Magnetic field components are obtained from Eq. (16):

$$\left.\begin{aligned} H_r &= -\beta\gamma_2 J_n'(\gamma_2 r)\cos n\varphi\, e^{i(\omega t - \beta z)}, \\ H_\varphi &= \beta_2 \frac{n}{r} J_n(\gamma_2 r)\sin n\varphi\, e^{i(\omega t - \beta z)}, \\ H_z &= -\frac{\gamma_2^2}{i\omega\mu} J_n(\gamma_2 r)\cos n\varphi\, e^{i(\omega t - \beta z)}. \end{aligned}\right\} \qquad (21)$$

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From Eq. (4.6) results the following transcendental equation with respect to χ_0:

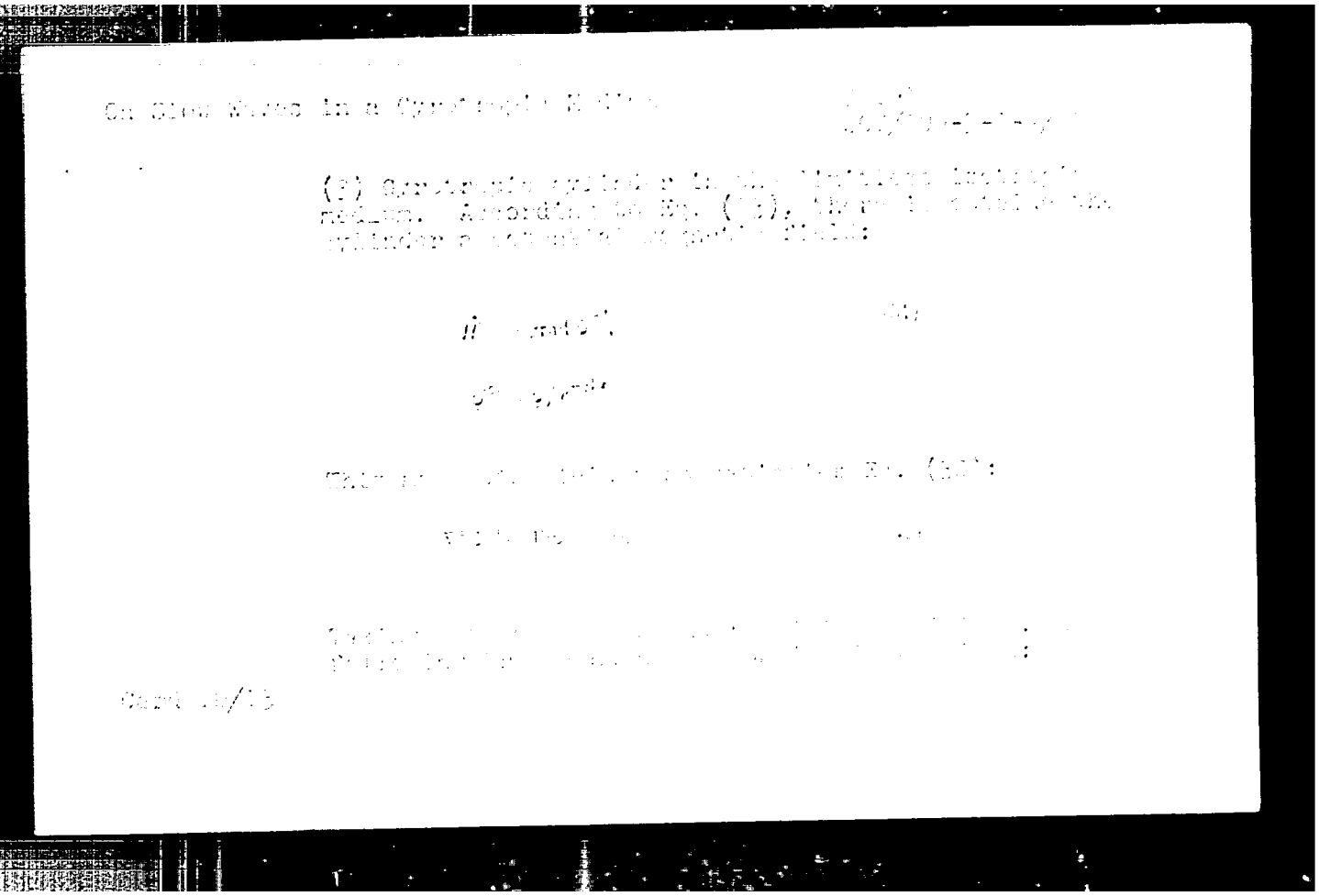
$$\beta_0 J_n'(\chi_0 R) \pm \frac{n\beta_0}{\chi_0 R} J_n(\chi_0 R) \mp n_z = 0. \qquad (2.3)$$

Two cases are discussed: for symmetrical waves with $n = 0$, and for nonsymmetrical waves when $n \neq 0$. For both cases the expressions for propagation constants Γ have been derived, and namely for the case of symmetrical waves in the form:

$$\Gamma = \pm j \frac{R_0}{R} \sqrt{n_z^2 - 1}. \qquad (2.5)$$

and for the case of nonsymmetrical waves in the form:

$$\Gamma = \pm j \frac{\chi_0 R}{R} \sqrt{\beta_0^2 - 1}, \quad \Gamma = \pm j \frac{\chi_0}{R} \sqrt{\beta_0^2 - 1}.$$



$$\varkappa_2 R \left[\frac{J_n'(\varkappa_2 R)}{J_n(\varkappa_2 R)} - \frac{\mu_0 \varkappa_0 H_n^{(2)\prime}(\varkappa_0 R)}{\mu \varkappa_2 H_n^{(2)}(\varkappa_0 R)} \right] = \frac{n k}{\varkappa_2}. \qquad (35)$$

where

$$\varkappa_0 = k \sqrt{1 - \frac{\varepsilon}{\mu_0} \varkappa^2}. \qquad (36)$$

(4) Gyrotropic cylinder placed coaxially in an ideally conducting pipe. For this case, the transcendental equation is given in the form:

$$\varkappa_2 R_1 \left[\frac{J_n'(\varkappa_2 R_0)}{J_n(\varkappa_2 R_0)} - \frac{\mu_0 \varkappa_0 J_n'(\varkappa_0 R_0) N_n'(\varkappa_0 R_1) - J_n'(\varkappa_0 R_1) N_n'(\varkappa_0 R_0)}{\mu \varkappa_2 J_n(\varkappa_0 R_0) N_n'(\varkappa_0 R_1) - J_n'(\varkappa_0 R_1) N_n(\varkappa_0 R_0)} \right] = \frac{n k}{\varkappa_2} \qquad (38)$$

(5) Magnetostatic oscillations. A cross section through any of the systems discussed under points 2 to 4 by two transverse ideally conducting planes placed at a distance:

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$$L = p\frac{\lambda}{2} = \frac{l}{\beta_{ef}}; \quad p = 1, 2, 3, \ldots \qquad (39)$$

gives a resonator, whose magnetic field is:

$$\vec{H} = \operatorname{grad}\varphi,$$

$$\varphi = \varphi_0 \cos\frac{\pi}{L}z. \qquad (40)$$

Oscillations of this resonator are analogous to oscillations investigated by Walker. The author considers saying that results obtained in the study may be used to investigate such problems as the wave spectrum, wave

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attenuation, the quality factor of magnetostatic resonators, etc. Systems in the shape of layer or of bar, as well as cases of transverse magnetization, may also be studied. There are 6 references, 1 Soviet, 5 U.S. The U.S. references are: L. R. Walker, Magnetostatic Modes in Ferromagnetic Resonance, Phys. Rev., 1957, 105, 2, 390; P. S. Epstein, Theory of Wave Propagation in a Gyromagnetic Medium, Rev. Mod. Phys., 1956, 20, 1, 3; M. L. Kales, Modes in Waveguides Containing Ferrites, J. Appl. Phys., 1953, 24, 5, 603; P. K. Tien, H. Suhl, Theory of Travelling-Wave Parametric Ferromagnetic Amplifier, Proc. I.R.E., 1958, 46, 4, 700; H. Suhl, R. L. Walker, Faraday Rotation of Guided Waves, Phys. Rev., 1952, 86, 122.

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AUTHOR: Nikol'skiy, V. V.

TITLE: Theory of Ferromagnetic Amplifiers Based on the Disturbance Principle

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ABSTRACT: In this study the analysis of traveling wave and ferromagnetic amplifiers is explained on the basis of the disturbance principle. The SHF supply field, which changes the magnetic susceptibility of ferrite, is considered to be disturbance of the system. (1) Preliminary Considerations. The expressions for the supplementary magnetization components are given for two cases: first, when ferrite is under the influence of two fields $\vec{H}_1$ (ω_1) and $\vec{H}_2$ (ω_2); and second, when it is affected by one field $\vec{H}$ (ω) only. It is shown that the real part of the magnetic permeability of the medium has not been changed practically by the disturbing;

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field; it remains constant at the primary field distribution. This permits one to identify the primary field with the disturbing field with an accuracy up to a spatially constant factor. This is valid for the resonators as well as for waveguides, the latter having a transversally distributed field. From the Maxwell equations two fundamental equations follow. For the resonator:

$$\frac{\dot{\omega} - \dot{\omega}_0}{\dot{\omega}} = \frac{\int_{V_\Phi} \dot{M}\vec{H}_0 dv}{\int_{V_0} \vec{H}_0 \vec{H}_0 dv} \qquad (9)$$

where $\dot{\omega}$ and $\dot{\omega}_0$ are the disturbance and primary complex frequencies, respectively; $\vec{H}_0$ is the primary field; $\vec{M}$ is the disturbing magnetization; V_0 is the entire volume of the resonator; V_Φ is the domain disturbance; and

μ is the tensor of magnetic permeability. For the waveguide:

$$\dot{\Gamma} - \dot{\Gamma}_0 = \frac{\omega}{2} \frac{\int_{S_\Phi} \dot{M} \dot{H}_0 dS}{\int_{S_0} (\dot{E}_0 \dot{H}_0) dS} \qquad (10)$$

where $\dot{\Gamma}$ and $\dot{\Gamma}_0$ are disturbance and primary complex wave coefficients, respectively; S_0 is the transversal cross section of the waveguide; and S_Φ is the transversal cross section of the domain disturbance. (2) Resonator With "One Natural Frequency." One of the natural frequencies coincides with the signal frequency and is equal to half of the frequency of the supply field. Introducing the expressions of the supplementary magnetization given in Part 1 into Eq. (9) after certain transformations, the following equation is obtained:

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$$\frac{1}{Q} = \left(\frac{\omega_0}{\omega}\right)^2 \frac{1}{Q_0} - \frac{1}{2}\frac{M^{\Pi}}{H_p} F \sin(\varphi^{\Pi} - 2\varphi + \varphi_F). \qquad (17)$$

where ω_0 is the primary frequency; $1/Q$ is the change in the resonator attenuation; Q_0 is the initial quality of the system; M^{Π} is amplitude of magnetization; and H_p is field constant of the Larmor resonance. F and φ_F are taken from the equation $\dot{F} = Fe^{j\varphi_F}$, where F is the fill-in factor. (Abstracter's Note: The term "fill-in factor" is a translation of the Russian term: Faktor zapolneniya); φ is the phase of the amplified signal and φ_{Π} corresponds to M^{Π}. Equation (17) shows that the change in the attenuation of the resonator as the response on the disturbing field may be positive or negative. It depends on the phase relation between the signal and disturbing field. The

condition of amplifying is determined by the inequality shown in Equation 18.

$$\sin(\gamma'' - 2\gamma + \gamma_P) > 0. \qquad (18)$$

The threshold value of the magnetization amplitude and the amplifying coefficient are given. (3) Resonator With "Two Natural Frequencies." In this case an analysis similar to that in Part 2 is explained for the system discussed by H. Suhl in References 1 and 2 of the Abstract. The resultant equation shows that the attenuation 1/Q of the system can only decrease. The amplitude of the signal always increases. In a similar way the threshold value of the amplitude of magnetization and the amplifying coefficient are explained. (4) Waveguide With "One Wave." (5) Waveguide With "Two Waves." In the first case, the amplified field of the frequency/ ω represents one of the waves of the guiding system. The supplying field of the double frequency